

SEQUENCE LISTING

<110> Chandrashekhar, Ramaswamy
Morales, Tony H.

<120> Parasitic Helminth Cuticlin Proteins, Nucleic Acid ~
Molecules, and Uses Thereof

<130> HW-8

<140> not yet assigned

<141> 1999-06-01

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<170> PatentIn Ver. 2.0

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Tyr Ser Ile Pro Val Asp Asn Gly Val Glu Gly Glu Pro Glu Ile Glu
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Cys Gly Pro Thr Ser Ile Thr Ile Asn Phe Asn Thr Arg Asn Ala Phe
35 40 45

gaa gga cat gtt tat gtg aaa ggt ctt tat gat caa gaa ggt tgc cgt 192
Glu Gly His Val Tyr Val Lys Gly Leu Tyr Asp Gln Glu Gly Cys Arg
50 55 60

aat gat gaa ggt gga cgt caa gtt gcc gga att tca ctt cca ttt gat 240
Asn Asp Glu Gly Arg Gln Val Ala Gly Ile Ser Leu Pro Phe Asp
65 70 75 80

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Ser Cys Asn Val Ala Arg Thr Arg Ser Leu Asn Pro Arg Gly Ile Phe
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| Thr Val Ser Ala Gln Ile Glu Val Ser Glu Ile Thr Thr Ala Phe Gln | | | |
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| Thr Gln Ile Val Pro Met Pro Val Cys Arg Tyr Glu Ile Leu Asp Gly | | | |
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| gga cca acc ggt caa cca gtt caa ttt gct atc att ggt cag cca gtt | | | 528 |
| Gly Pro Thr Gly Gln Pro Val Gln Phe Ala Ile Ile Gly Gln Pro Val | | | |
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| 180 | 185 | 190 | |
| gtt gtc cat tcc tgc ttt gtc gat gat ggt aac ggt gat act gtg gaa | | | 624 |
| Val Val His Ser Cys Phe Val Asp Asp Gly Asn Gly Asp Thr Val Glu | | | |
| 195 | 200 | 205 | |
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| Ile Leu Asn Ala Asp Gly Cys Ala Leu Asp Lys Tyr Leu Leu Asn Asn | | | |
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| ttg gaa tat cca aca gat tta atg gct ggc caa gaa gct cac gta tac | | | 720 |
| Leu Glu Tyr Pro Thr Asp Leu Met Ala Gly Gln Glu Ala His Val Tyr | | | |
| 225 | 230 | 235 | 240 |
| aaa tat gcg gat cga tca cag ctt ttc tat caa tgc cag atc agt att | | | 768 |
| Lys Tyr Ala Asp Arg Ser Gln Leu Phe Tyr Gln Cys Gln Ile Ser Ile | | | |
| 245 | 250 | 255 | |
| acc att aaa gaa cca aat agc gaa tgt gtt cga cca caa tgt tca gaa | | | 816 |
| Thr Ile Lys Glu Pro Asn Ser Glu Cys Val Arg Pro Gln Cys Ser Glu | | | |
| 260 | 265 | 270 | |
| cca caa gga ttc gga gct gtt aaa aca ggt ggt gcc gca gca aaa cct | | | 864 |
| Pro Gln Gly Phe Gly Ala Val Lys Thr Gly Gly Ala Ala Ala Lys Pro | | | |
| 275 | 280 | 285 | |
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| Ala Ala Ala Gln Leu Arg Leu Leu Lys Lys Arg Ser Ala Glu Pro | | | |
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| caa cat aat gga caa cct gta ata ctt gct gca gta caa aat gga atc | | | 1056 |
| Gln His Asn Gly Gln Pro Val Ile Leu Ala Ala Val Gln Asn Gly Ile | | | |
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| Glu Gly His Val Tyr Val Lys Gly Leu Tyr Asp Gln Glu Gly Cys Arg | | | |
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| Asn Asp Glu Gly Arg Gln Val Ala Gly Ile Ser Leu Pro Phe Asp | | | |
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| Ser Cys Asn Val Ala Arg Thr Arg Ser Leu Asn Pro Arg Gly Ile Phe | | | |
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20 25 30

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Val Cys Arg Tyr Glu Ile Leu Glu Gly Pro Thr Gly Ala Pro Val
35 40 45

cga ttt gca atg att gga gat cat gta tat cac aaa tgg aca tgt gat 192
Arg Phe Ala Met Ile Gly Asp His Val Tyr His Lys Trp Thr Cys Asp
50 55 60

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| 85 | 90 | 95 | | |
| | | | | -- |
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| 100 | 105 | 110 | | |
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| 145 | 150 | 155 | 160 | |
| | | | | -- |
| aaa tct gga caa gga ttt gct gta aaa tct gct gca cca gct Lys Ser Gly Gln Gly Phe Ala Ala Val Lys Ser Ala Ala Ala Pro Ala | | | | 528 |
| 165 | 170 | 175 | | |
| | | | | -- |
| cca gaa gct tcc ttg ctt tct cca cga ttg atc aag aag cga tca att Pro Glu Ala Ser Leu Leu Ser Pro Arg Leu Ile Lys Lys Arg Ser Ile | | | | 576 |
| 180 | 185 | 190 | | |
| | | | | -- |
| aat tct gat aat acg gtg gac gtc agt acc ggt ttt agc acg gtt gat Asn Ser Asp Asn Thr Val Asp Val Ser Thr Gly Phe Ser Thr Val Asp | | | | 624 |
| 195 | 200 | 205 | | |
| | | | | -- |
| ata acc gaa gag aat ccg aac ttc tca gca aat cgt tta tca tca tca Ile Thr Glu Glu Asn Pro Asn Phe Ser Ala Asn Arg Leu Ser Ser Ser | | | | 672 |
| 210 | 215 | 220 | | |
| | | | | -- |
| acg agc cgt gaa caa ttc aat ggt atc ttc tgt att gca tca aat gat Thr Ser Arg Glu Gln Phe Asn Gly Ile Phe Cys Ile Ala Ser Asn Asp | | | | 720 |
| 225 | 230 | 235 | 240 | |
| | | | | -- |
| att tta ctt atc att ttg ttc ggt gct atg tta gct att gct tgc ata Ile Leu Leu Ile Ile Leu Phe Gly Ala Met Leu Ala Ile Ala Cys Ile | | | | 768 |
| 245 | 250 | 255 | | |
| | | | | -- |
| ttt ttt acc gct ttt ctt gtt cat tcc aat aat cat tct aaa tca Phe Phe Thr Ala Phe Leu Val His Ser Asn Asn His Ser Lys Ser | | | | 813 |

260

265

270

<210> 9

<211> 271

<212> PRT

<213> *Dirofilaria immitis*

<400> 9

Met Phe Leu Tyr Gly Lys Leu Ile Arg Pro Leu Val Leu Val Leu Glu
1 5 10 15

Val Ser Glu Met Thr Thr Ala Phe Gln Thr Gln Val Val Pro Met Pro
20 25 30

Val Cys Arg Tyr Glu Ile Leu Glu Gly Gly Pro Thr Gly Ala Pro Val
35 40 45

Arg Phe Ala Met Ile Gly Asp His Val Tyr His Lys Trp Thr Cys Asp
50 55 60

Ser Glu Thr Thr Asp Thr Phe Cys Ala Leu Val His Ser Cys Val Val
65 70 75 80

Asp Asp Gly Lys Gly Asp Ala Val Glu Ile Leu Asn Glu Glu Gly Cys
85 90 95

Ala Leu Asp Lys Tyr Leu Leu Asn Asn Leu Glu Tyr Ile Thr Asp Leu
100 105 110

Met Ala Gly Gln Glu Ala His Val Tyr Lys Tyr Ala Asp Arg Ser Glu
115 120 125

Leu Tyr Tyr Gln Cys Gln Ile Ser Ile Thr Ile Lys Glu Pro His Ser
130 135 140

Glu Cys Pro Arg Pro Gln Cys Thr Glu Pro Gln Gly Phe Gly Ala Ile
145 150 155 160

Lys Ser Gly Gln Gly Phe Ala Ala Val Lys Ser Ala Ala Ala Pro Ala
165 170 175

Pro Glu Ala Ser Leu Leu Ser Pro Arg Leu Ile Lys Lys Arg Ser Ile
180 185 190

Asn Ser Asp Asn Thr Val Asp Val Ser Thr Gly Phe Ser Thr Val Asp
195 200 205

Ile Thr Glu Glu Asn Pro Asn Phe Ser Ala Asn Arg Leu Ser Ser Ser
210 215 220

Thr Ser Arg Glu Gln Phe Asn Gly Ile Phe Cys Ile Ala Ser Asn Asp
225 230 235 240

Ile Leu Leu Ile Ile Leu Phe Gly Ala Met Leu Ala Ile Ala Cys Ile
245 250 255

Phe Phe Thr Ala Phe Leu Val His Ser Asn Asn His Ser Lys Ser
260 265 270

<210> 10

<211> 813

<212> DNA

<213> *Dirofilaria immitis*

<400> 10

tgatttagaa tgattattgg aatgaacaag aaaagcggta aaaaatatgc aagcaatgc 60

taacatagca ccgaacaaaaa tgataagtaa aatatcattt gatgcaatac agaagatacc 120

attgaattgt tcacggctcg ttgatgatga taaacgattt gctgagaagt tcggattctc 180

ttcggttata tcaaccgtgc taaaacccgt actgacgtcc accgtattat cagaattaat 240

tgatcgcttc ttgatcaatc gtggagaaag caaggaagct tctggagctg gtgcagcago 300

agattttaca gcagcaaatac cttgtccaga ttttatggca ccaaattcattt gtggctctgt 360

gcatttgttgt cgaggacatt cgctatgtgg ctctttaatt gttataactaa tctggcattt 420

atagtaaaatgt tctgatcgat ctgcataatattt ataaacatga gcttcttggc cagccattaa 480

atctgtata tattccaaat tattgagtaa atatttgtcc aaagcacatc cttcttcatt 540

cagaatctcc actgcatcac cttttccatc atccacaaca catgaatgta ctaatgcaca 600

gaatgtatct gtagtctctg aatcacatgt ccatttgtga tatacatgat ctccaatcat 660

tgcaaattcga acaggtgcac cagttggtcc accttccaaa atctcatatc gacatacggg 720

cattggtacc acttgagttt ggaatgtgt agtcatttca gatacttcaa ggaccagtac 780

taacggtctt atcagcttcc catataaaaaa cat 813

THE JOURNAL OF CLIMATE

<210> 11
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Primer

<400> 11
ggctggccaa gaagctcacg tatacaaata tgcg 34

<210> 12
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Primer

<400> 12
cgcatatttg tatacgtgag cttcttggcc agcc 34

<210> 13
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Primer

<400> 13
ggtttaatta cccaaatgg ag 22

<210> 14
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Primer

<400> 14
ccatcctaat acgactcact atagggc 27

<210> 15
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Primer

<400> 15
ggttatatca accgtgctaa aaccggtaact gacgtccacc g 41

<210> 16
<211> 892
<212> DNA
<213> Brugia malayi

<220>
<221> CDS
<222> (158)..(892)

<400> 16
ggtttaatta cccaaagtttg agatcattaa aattgatcat caataattca ataatttgg 60
gcaatttcaa attaattcatt ttgctaattc tattattcca actattttca tcactaatca 120
ctgagaagaa atcaggaaga aagaagcaaa aagttaa atg ttg cat atg caa att 175
Met Leu His Met Gln Ile
1 5

tgc tca ttt ttg tca tat atg ata ata gca agt att aat gct att cca 223
Cys Ser Phe Leu Ser Tyr Met Ile Ile Ala Ser Ile Asn Ala Ile Pro
10 15 20

att gat aat ggt gtc gaa agt gaa cct gaa att gaa tgt ggt cca aca 271
Ile Asp Asn Gly Val Glu Ser Glu Pro Glu Ile Glu Cys Gly Pro Thr
25 30 35

tca atc act gtt aat ttt aat act cga aat cct ttt gaa gga cat gta 319
Ser Ile Thr Val Asn Phe Asn Thr Arg Asn Pro Phe Glu Gly His Val
40 45 50

tat gct aaa gga tta tac agt aat caa gat tgt cgt agt gat gaa ggt 367

| | | | | | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Tyr | Ala | Lys | Gly | Leu | Tyr | Ser | Asn | Gln | Asp | Cys | Arg | Ser | Asp | Glu | Gly | 55 | 60 | 65 | 70 |
| gga cgt cag gta gcc gga ata tca tta ccg ttt gat tca tgt aat gtc | | | | | | | | | | | | | | | 415 | | | | |
| Gly | Arg | Gln | Val | Ala | Gly | Ile | Ser | Leu | Pro | Phe | Asp | Ser | Cys | Asn | Val | | | | |
| | | | | | | | | | | | | | | | | 75 | 80 | 85 | |
| gca cgt aca cgt tcg tta aat cca cgt gga ata ttt gtc aca gct gtt | | | | | | | | | | | | | | | 463 | | | | |
| Ala | Arg | Thr | Arg | Ser | Leu | Asn | Pro | Arg | Gly | Ile | Phe | Val | Thr | Ala | Val | | | | |
| | | | | | | | | | | | | | | | | 90 | 95 | 100 | |
| gtg gta att acg ttt cat cca cag ttt atc aca aaa gtt gat cga aca | | | | | | | | | | | | | | | 511 | | | | |
| Val | Val | Ile | Thr | Phe | His | Pro | Gln | Phe | Ile | Thr | Lys | Val | Asp | Arg | Thr | | | | |
| | | | | | | | | | | | | | | | | 105 | 110 | 115 | |
| tat cga ttg caa tgc ttt tac atg gaa gct gat aag act gtt agc aca | | | | | | | | | | | | | | | 559 | | | | |
| Tyr | Arg | Leu | Gln | Cys | Phe | Tyr | Met | Glu | Ala | Asp | Lys | Thr | Val | Ser | Thr | | | | |
| | | | | | | | | | | | | | | | | 120 | 125 | 130 | |
| caa att gaa gtt tcc gaa atg aca acc gta ttt gct aca caa ttg gta | | | | | | | | | | | | | | | 607 | | | | |
| Gln | Ile | Glu | Val | Ser | Glu | Met | Thr | Thr | Val | Phe | Ala | Thr | Gln | Leu | Val | | | | |
| | | | | | | | | | | | | | | | | 135 | 140 | 145 | 150 |
| cca atg cct gtg tgt aga tat gag att ctg gat ggt ggt cca acc gga | | | | | | | | | | | | | | | 655 | | | | |
| Pro | Met | Pro | Val | Cys | Arg | Tyr | Glu | Ile | Leu | Asp | Gly | Gly | Pro | Thr | Gly | | | | |
| | | | | | | | | | | | | | | | | 155 | 160 | 165 | |
| caa cct gtc cag tat gct aat att gga caa ccg gtt tat cat aaa tgg | | | | | | | | | | | | | | | 703 | | | | |
| Gln | Pro | Val | Gln | Tyr | Ala | Asn | Ile | Gly | Gln | Pro | Val | Tyr | His | Lys | Trp | | | | |
| | | | | | | | | | | | | | | | | 170 | 175 | 180 | |
| aca tgt gat tct gaa aca gtt gat acc ttc tgt gct ttg gta cat tcc | | | | | | | | | | | | | | | 751 | | | | |
| Thr | Cys | Asp | Ser | Glu | Thr | Val | Asp | Thr | Phe | Cys | Ala | Leu | Val | His | Ser | | | | |
| | | | | | | | | | | | | | | | | 185 | 190 | 195 | |
| tgt ttt gtt gat gat ggc aat ggt gac agt att aat tta att aat gaa | | | | | | | | | | | | | | | 799 | | | | |
| Cys | Phe | Val | Asp | Asp | Gly | Asn | Gly | Asp | Ser | Ile | Asn | Leu | Ile | Asn | Glu | | | | |
| | | | | | | | | | | | | | | | | 200 | 205 | 210 | |
| gaa gga tgt gca tta gat cga tat ctt cta aat aat ttg gaa tat cca | | | | | | | | | | | | | | | 847 | | | | |
| Glu | Gly | Cys | Ala | Leu | Asp | Arg | Tyr | Leu | Leu | Asn | Asn | Leu | Glu | Tyr | Pro | | | | |
| | | | | | | | | | | | | | | | | 215 | 220 | 225 | 230 |
| act gat cta atg gct ggc caa gaa gct cac gta tac aaa tat gcg | | | | | | | | | | | | | | | 892 | | | | |
| Thr | Asp | Leu | Met | Ala | Gly | Gln | Glu | Ala | His | Val | Tyr | Lys | Tyr | Ala | | | | | |
| | | | | | | | | | | | | | | | | 235 | 240 | 245 | |

<210> 17
<211> 245
<212> PRT
<213> Brugia malayi

<400> 17

Met Leu His Met Gln Ile Cys Ser Phe Leu Ser Tyr Met Ile Ile Ala
1 5 10 15

Ser Ile Asn Ala Ile Pro Ile Asp Asn Gly Val Glu Ser Glu Pro Glu
20 25 30

Ile Glu Cys Gly Pro Thr Ser Ile Thr Val Asn Phe Asn Thr Arg Asn
35 40 45

Pro Phe Glu Gly His Val Tyr Ala Lys Gly Leu Tyr Ser Asn Gln Asp
50 55 60

Cys Arg Ser Asp Glu Gly Gly Arg Gln Val Ala Gly Ile Ser Leu Pro
65 70 75 80

Phe Asp Ser Cys Asn Val Ala Arg Thr Arg Ser Leu Asn Pro Arg Gly
85 90 95

Ile Phe Val Thr Ala Val Val Val Ile Thr Phe His Pro Gln Phe Ile
100 105 110

Thr Lys Val Asp Arg Thr Tyr Arg Leu Gln Cys Phe Tyr Met Glu Ala
115 120 125

Asp Lys Thr Val Ser Thr Gln Ile Glu Val Ser Glu Met Thr Thr Val
130 135 140

Phe Ala Thr Gln Leu Val Pro Met Pro Val Cys Arg Tyr Glu Ile Leu
145 150 160

Asp Gly Gly Pro Thr Gly Gln Pro Val Gln Tyr Ala Asn Ile Gly Gln
165 170 175

Pro Val Tyr His Lys Trp Thr Cys Asp Ser Glu Thr Val Asp Thr Phe
180 185 190

Cys Ala Leu Val His Ser Cys Phe Val Asp Asp Gly Asn Gly Asp Ser
195 200 205

Ile Asn Leu Ile Asn Glu Glu Gly Cys Ala Leu Asp Arg Tyr Leu Leu
210 215 220

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Asn | Leu | Glu | Tyr | Pro | Thr | Asp | Leu | Met | Ala | Gly | Gln | Glu | Ala | His |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |

Val Tyr Lys Tyr Ala
245

<210> 18
<211> 892
<212> DNA
<213> *Brugia malayi*